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SCSを用いた数式処理システムの利用技術について

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概　要

We have started a project of making remote control system for computer algebra systems by using SCS(space collaboration system) in a public observatory in Japan. The SCS has user-friendly interface for TV meeting.

An Efficient use of computer algebra systems on the SCS is proposed to improve the new technology and will contribute real time mathematical communication(presentation, discussion or education).

In this paper, we describe a brief introduction to project for the remote control system of computer algebra systems by using SCS.

1 Introduction

The project(remote control system of computer algebra systems by using SCS) is included in the joint researches which were organized publicly by NIME(National Institute of Multimedia Education)([1]). The joint researches started on April 1997, for the purpose of developing new techniques using mathematical communication on the SCS offered by NIME. The joint researches are composed of nearly ten projects and classified into two categories;

One is long distance TV meeting, and the other is IP communication on the SCS.

The remote control system of computer algebra systems by using SCS belongs to the latter category.

The fundamental idea of this project is to make presentation, research discussion and university lectures with using computer algebra systems available.The general idea of this project is explained as follows.

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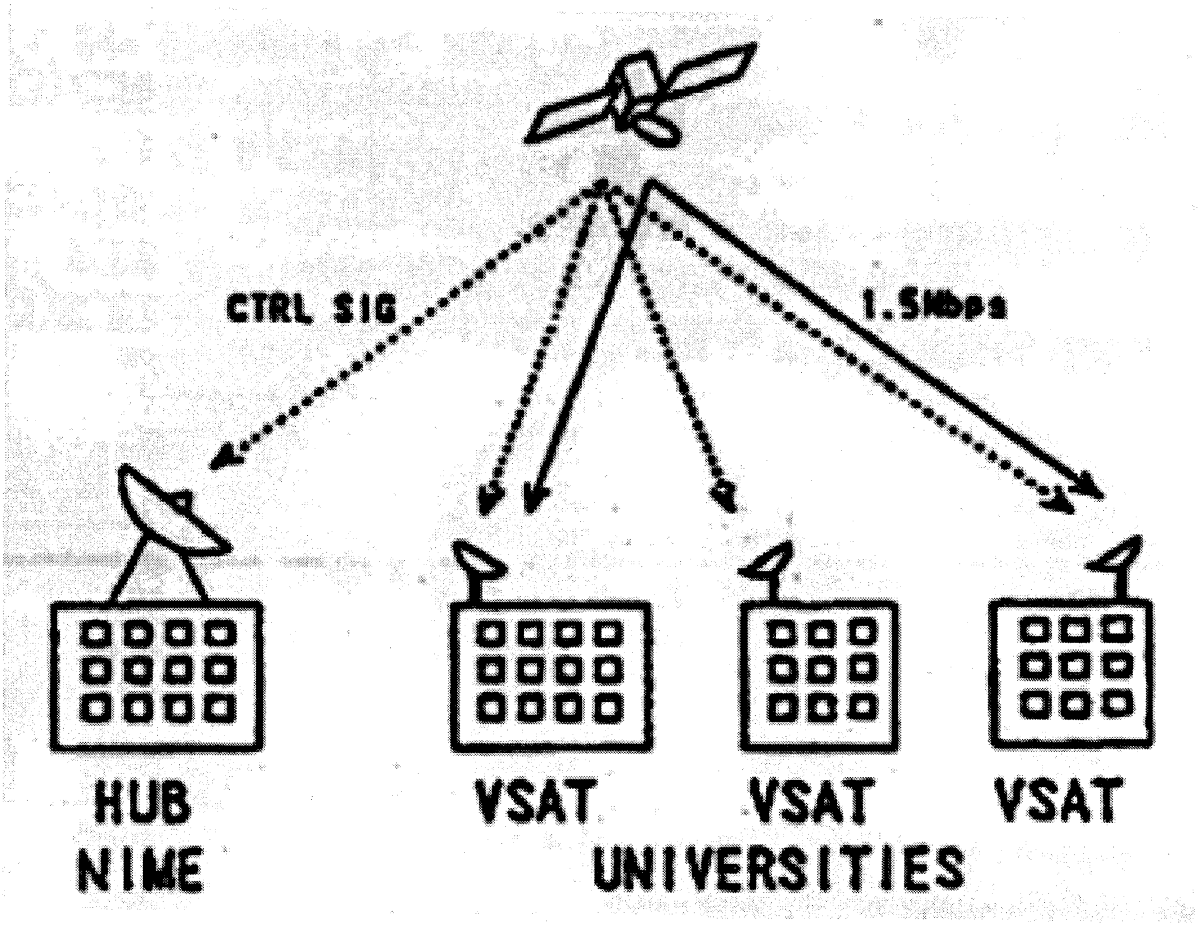

図 1: SCS 構成図

図 2: SCS の画面

A new real time mathematical communication with using computer algebra systems must be introduced.

In next section, empirical studies executed on the SCS are introduced. Summary and a future prospect will be given in the last section.

2 Empirical Studies in Kobe Univ. and Ehime Univ.

2.1 Test of IP Connection on the SCS

First test of this project is done in February 1998. This was a test IP connection on the SCS(via satellite) by Dr. Tanaka from Ehime Univ.(no audience) to Kobe Univ.(audience). At this time, we used completely manual connection.

2.2 Presentation

Second test of this project is done in March 1998. This was a presentation by Mr. Takeuchi from Ehime Univ. (audience) in the 6th Risa consortium to Hirosaki Univ.

(audience), Iwate Univ. (audience), Tokyo Univ.(audience), Gunma college of Tech. (audience), Kobe Univ. (audience), Hirosima Univ. (audience).

To examine the remote control of computer algebra systems by using SCS, Risa of PC at Kobe Univ. was operated from Ehime Univ. on the SCS. Graphics was slow(demerits), though computations went smoothly(merits). Then the presentation was successful.

2.3 Practical use for Research and Education Activities

After experimental presentation with using computer algebra systems on the SCS, we decided to use it for routine research and education activities.

Kobe Univ. and Ehime Univ. have a joint research project and we are planning to hold a lecture by using SCS. Discussion about research issues requires a mathematical communication channel that makes participants forget distance between them. The lecture using computer algebra systems on the SCS will be efficient.

3 Conclusion

According to the rapid progress of SCS, so called globalization or borderless will become gradually markable. The influence to education as well as culture must be striking.

Issues concerning SCS are roughly divided into two classed:

One is the problem of constructing infla-structure, which has already been obtaining some results([2]). The other problem is lack of good contents to be shared on the SCS. The latter problem will become serious in near future.

This project aims to solve the problems and authors tried to make clear what is the serious obstacle of the latter problem through the experiments of computer algebra systems on the SCS.

参 考 文 献

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[2] Kimio Kondo, Kenji Tanaka, Hitoshi Ohnishi and Tomotugu Kondo: Examination of space collaboration system (In Japanese), Proceeding of Japan Society for Electrical Information and Communication, D-707, 1996.